

OPERATING SUMMARY

TOWN OF
MARKHAM

WATER POLLUTION CONTROL PLANT

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MARKHAM
WATER POLLUTION CONTROL PLANT

operated for
THE TOWN OF MARKHAM
by the

MINISTRY OF THE ENVIRONMENT

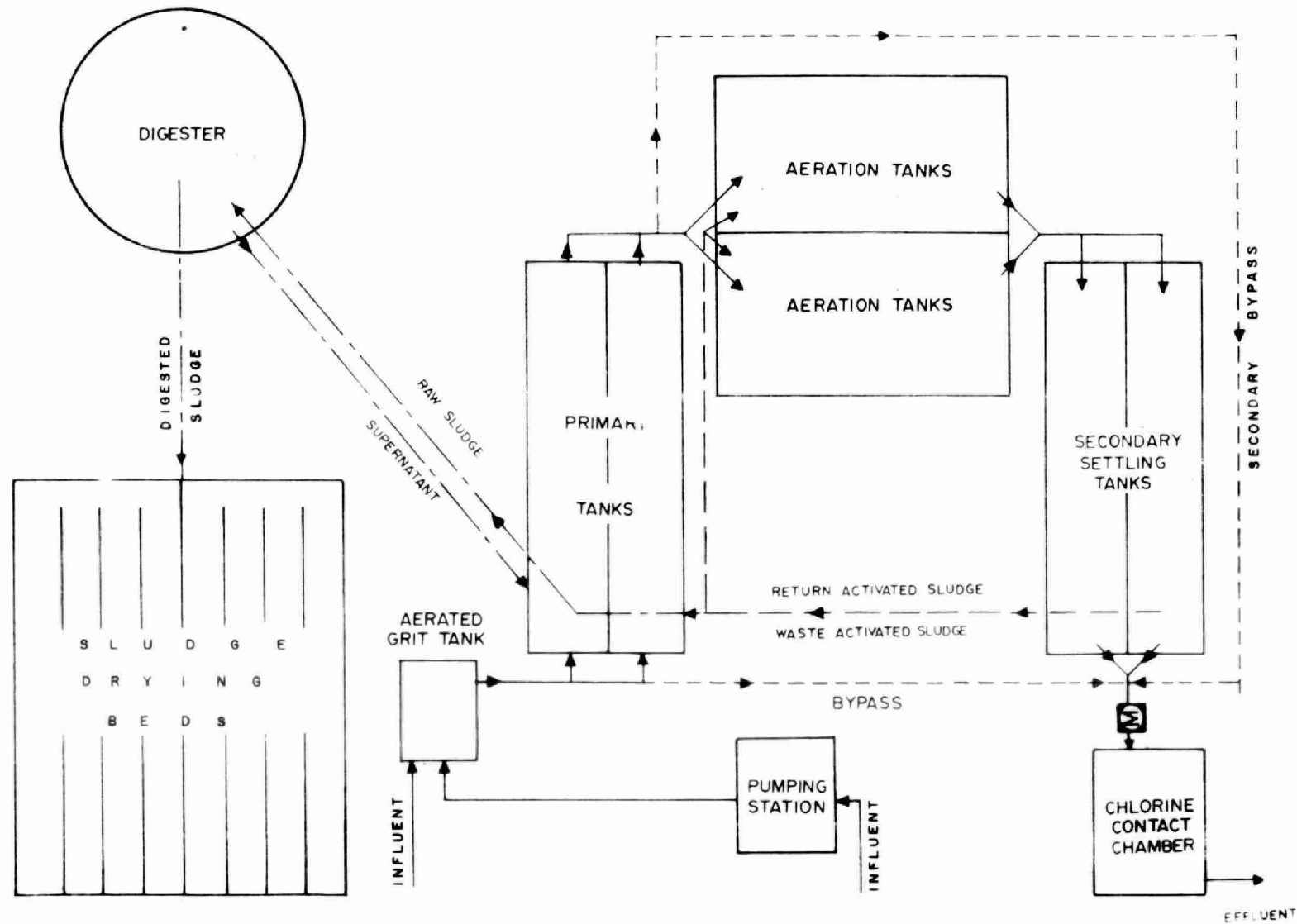
1974 ANNUAL OPERATING SUMMARY

prepared by
Plant Performance Unit
TECHNICAL SERVICES BRANCH
T. Cross, Director

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TOWN OF MARKHAM WATER POLLUTION CONTROL PLANT



DESIGN DATA

PROJECT Town of Markham WPCP

PROJECT NO. 2-0040-59

TREATMENT Activated Sludge

DESIGN FLOW 0.67 mgd

DESIGN POPULATION 8,000

BOD - Raw Sewage 215 mg/l
- Removal 95%

SS - Raw Sewage 220 mg/l
- Removal 95%

PUMPING STATION

Type: Fairbanks-Morse
Size: Two 350 gpm @ 40' tdh

PRIMARY TREATMENT

Comminution

Type: C.P. Barminutor
Size: One 18"

Grit Removal

Type: Aerated
Size: One 13' x 6' x 8.1' swd
(4,240 gal)
Retention: 9.2 min

Primary Sedimentation

Type: Jeffrey
Size: Two 42' x 12' x 7' 9" (avg)
(48,800 gal)
Retention: 1.76 hours
Loading: Surface, 660 gal/ft²/day
Weir, 27,800 gal/ft/day

SECONDARY TREATMENT

Aeration Tanks

Type: Diffused air, two pass
Size: One 51'x22'x15' plus one
51'x28'x15' (38,250 cu.
ft. or 239,000 gallons)

Air Supply

Type: Sutorbilt and Aerzen
Size: One 700 scfm @ 5 psi (standby)
One 1075 scfm

Diffusers

- 72 spargers (17" centre)

Secondary Sedimentation

Type: Jeffrey
Size: Two 42' x 12' x 10.5' (avg)
(66,000 gal)
Retention: 2.38 hours
Loading: Surface, 660 gal/ft²/day
Weir, 4,750 gal/ft/day

CHLORINATION

Type: W & T
Size: One 70 lb/day

Chlorine Contact Chamber

Size: 20' x 11.38' x 8.5' swd (12,080 gal)
Retention: 26 min

OUTFALL

- to Exhibition Creek
(tributary of Rouge River)

SLUDGE HANDLING

Digestion System - Single-stage

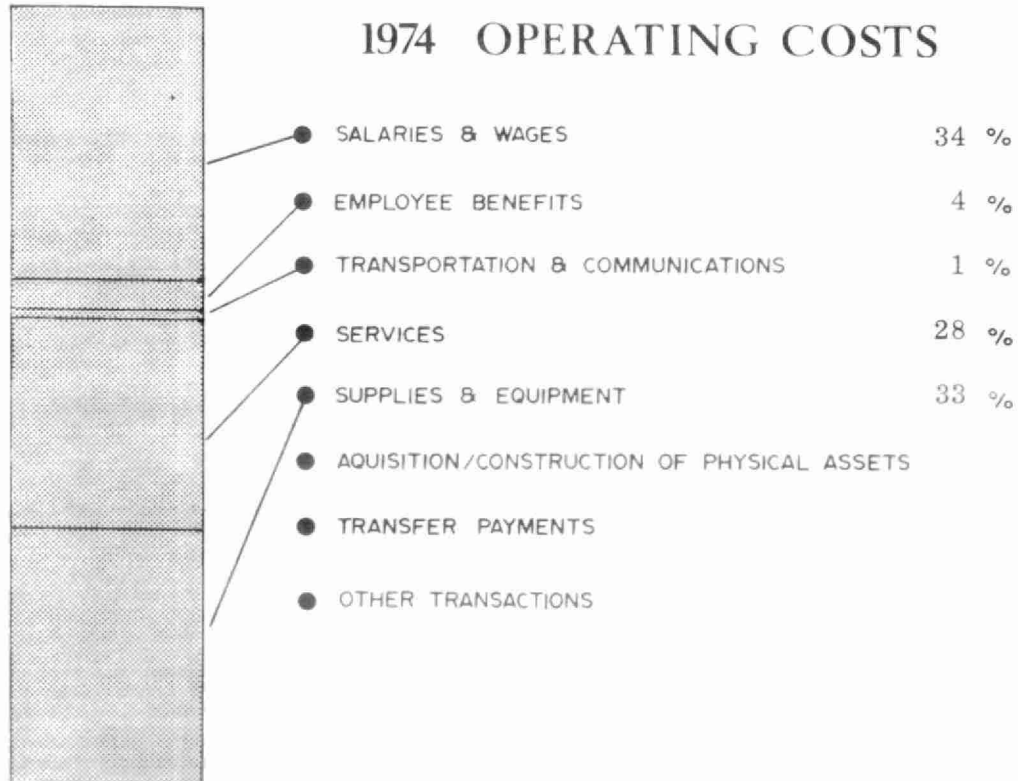
Type: Mixed by recirculation
Size: One 45' dia x 20' swd (34,240 cu ft
or 220,000 gal)
Loading: 0.67 lb/cu ft/ mo

Sludge Drying Beds

Size: Four 90' x 20' (7,200 sq ft)

ANNUAL COSTS

1974 OPERATING COSTS



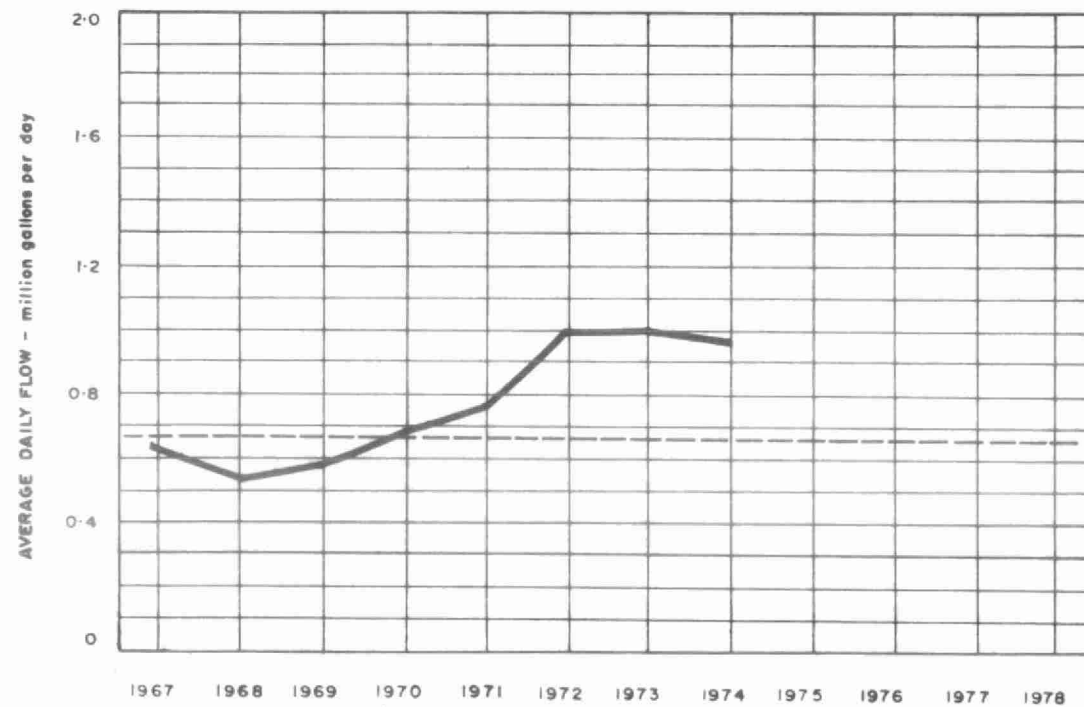
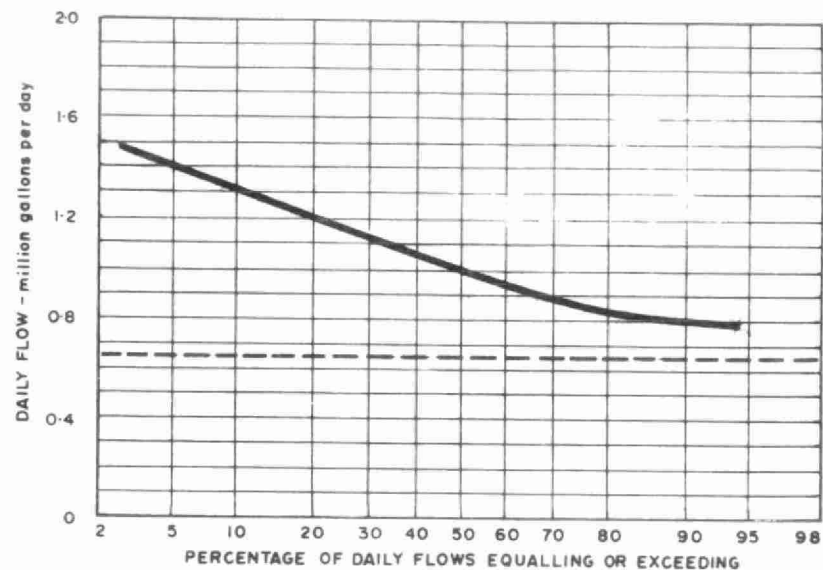
YEARLY OPERATING COSTS

YEAR	SEWAGE TREATED in million gallons	TOTAL OPERATING COSTS	UNIT COSTS	
			\$/M.G	¢/lb BOD
1969	217	29,099	134	9
1970	249	36,428	146	9
1971	280	43,581	156	4
1972	366*	45,923	125	11
1973	359	50,232	140	12
1974	354	66,944	189	20

OPERATING EXPENDITURES

Regular Staff	\$ 22,839	\$
Casual (Unclassified) Staff	-	
TOTAL SALARIES AND WAGES		22,839
TOTAL EMPLOYEE BENEFITS		2,359
TOTAL TRANSPORTATION AND COMMUNICATIONS		669
Insurance	1,449	
Sludge Haulage	15,859	
Repairs and Maintenance	705	
Other Services	913	
TOTAL SERVICES		18,926
Machinery and Equipment	8,429	
Chemicals	3,235	
Utilities	8,703	
Other Supplies and Equipment	1,784	
TOTAL SUPPLIES AND EQUIPMENT		22,151
TOTAL AQUISITION/CONSTRUCTION OF PHYSICAL ASSETS		
TOTAL TRANSFER PAYMENTS		
OTHER TRANSACTIONS		
GRAND TOTAL	GRAND TOTAL	\$ 66,944

PROCESS DATA FLOWS

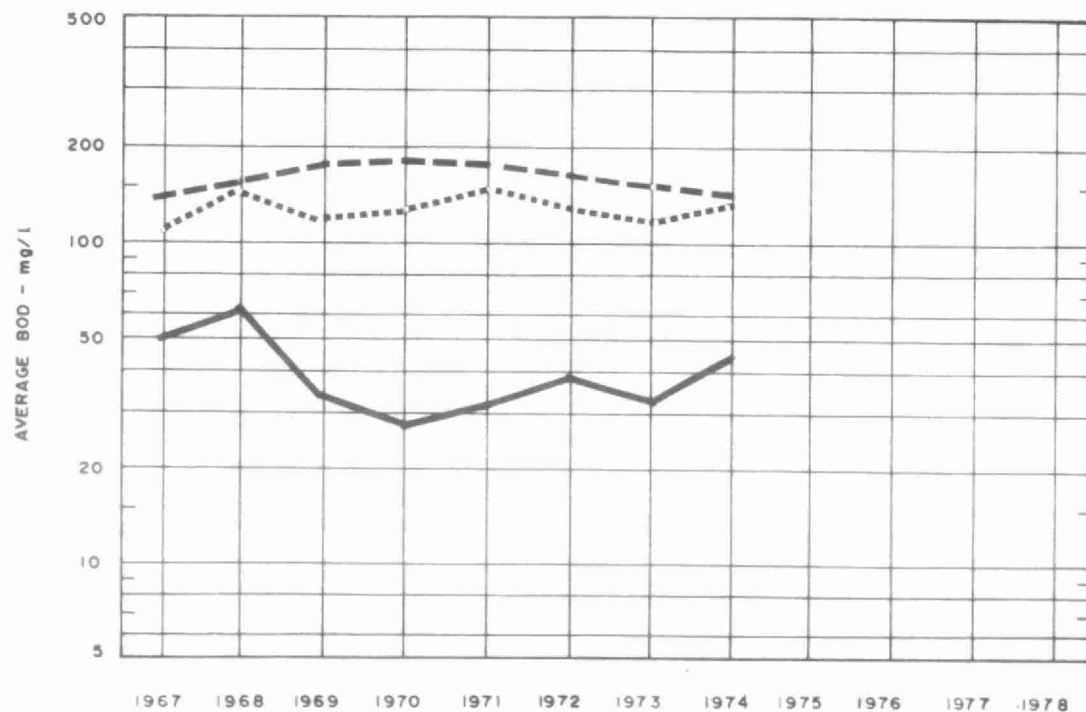
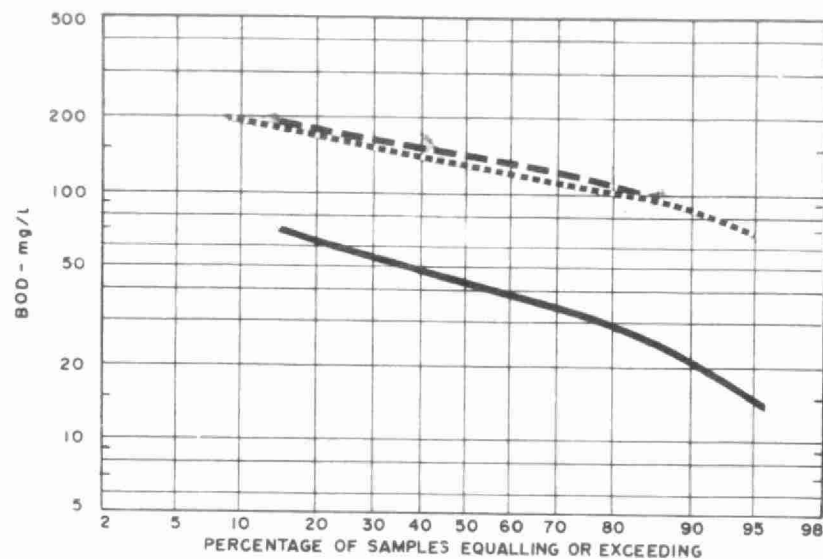


DESIGN CAPACITY - - - - -

PLANT PERFORMANCE

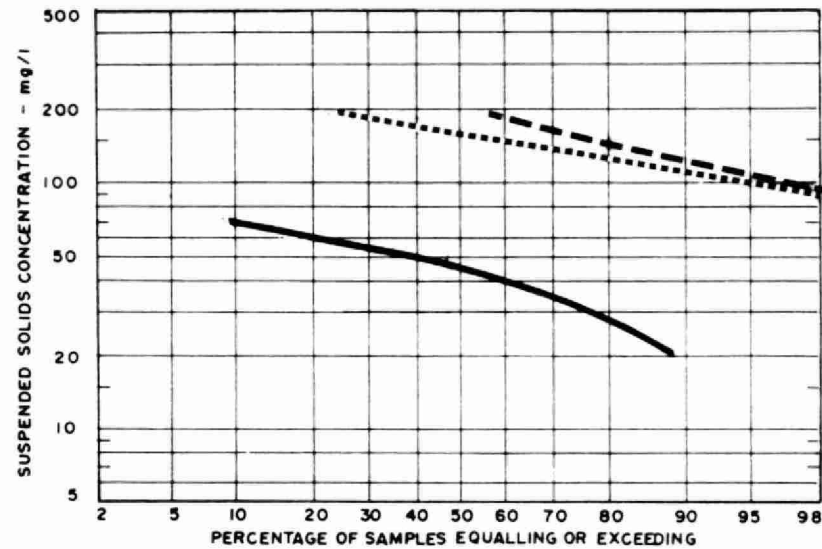
MONTH	FLOWS			BIOCHEMICAL OXYGEN DEMAND				SUSPENDED SOLIDS				PHOSPHORUS	
	TOTAL FLOW	AVERAGE DAY	MAXIMUM DAY	INFLUENT	EFFLUENT	REDUCTION		INFLUENT	EFFLUENT	REDUCTION		INFLUENT	EFFLUENT
	million gallons	mil. gal	mgd	mg/l	mg/l	%	10 ³ pounds	mg/l	mg/l	%	10 ³ pounds	mg/l P	mg/l P
JAN	31.6	1.02	1.5	145	45	69	31.6	155	48	69	33.8	7.8	5.1
FEB	25.7	.92	1.2	165	63	62	26.2	225	55	76	43.7	8.8	5.5
MAR	29.4	.95	1.1	133	68	49	19.1	178	35	80	42.0	9.5	4.5
APR	32.8	1.09	1.6	103	32	69	23.3	113	40	65	23.9	6.1	4.9
MAY	33.6	1.09	1.4	118	41	65	25.9	155	55	65	33.6	6.5	5.3
JUNE	31.8	1.06	1.5	121	59	51	19.7	163	37	77	40.1	7.6	5.0
JULY	29.8	.96	1.2	193	51	74	42.3	188	60	68	38.1	9.7	4.7
AUG	26.7	.86	1.0	115	24	79	24.3	175	28	84	39.2	7.7	5.0
SEPT	27.5	.92	1.0	120	58	52	17.1	195	58	70	37.7	15.9	7.8
OCT	29.1	.94	1.8	135	51	62	24.4	200	35	83	48.0	8.8	6.3
NOV	28.5	.95	1.3	180	21	88	45.3	215	18	92	56.1	8.3	5.6
DEC	28.4	.92	1.1	150	37	75	32.1	148	38	74	31.2	6.9	5.9
TOTAL	354.9	-	-	-	-	-	337.2	-	-	-	472.0	-	-
AVG.	29.6	.97	MAXIMUM 1.8	141	46	67	28.1	176	43	76	39.3	8.8	5.4
No. of Samples	-	-	-	27	27	-	-	26	26	-	-	27	27




BIOCHEMICAL OXYGEN DEMAND

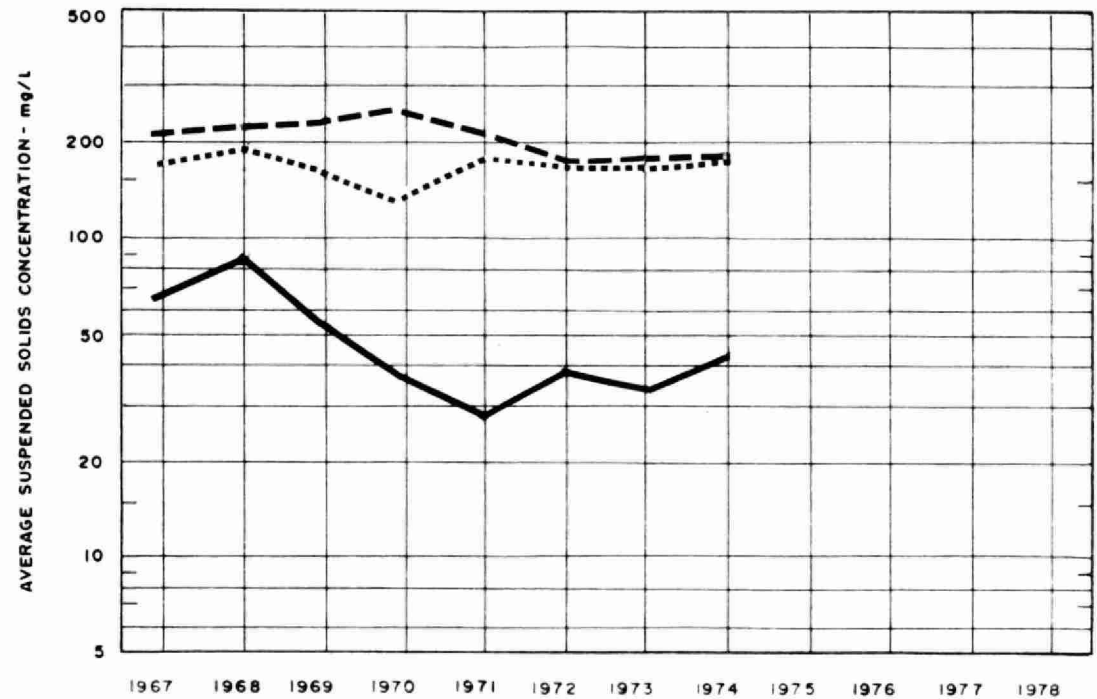


PLANT INFLUENT - - - - -
 PRIMARY EFFLUENT
 PLANT EFFLUENT —————

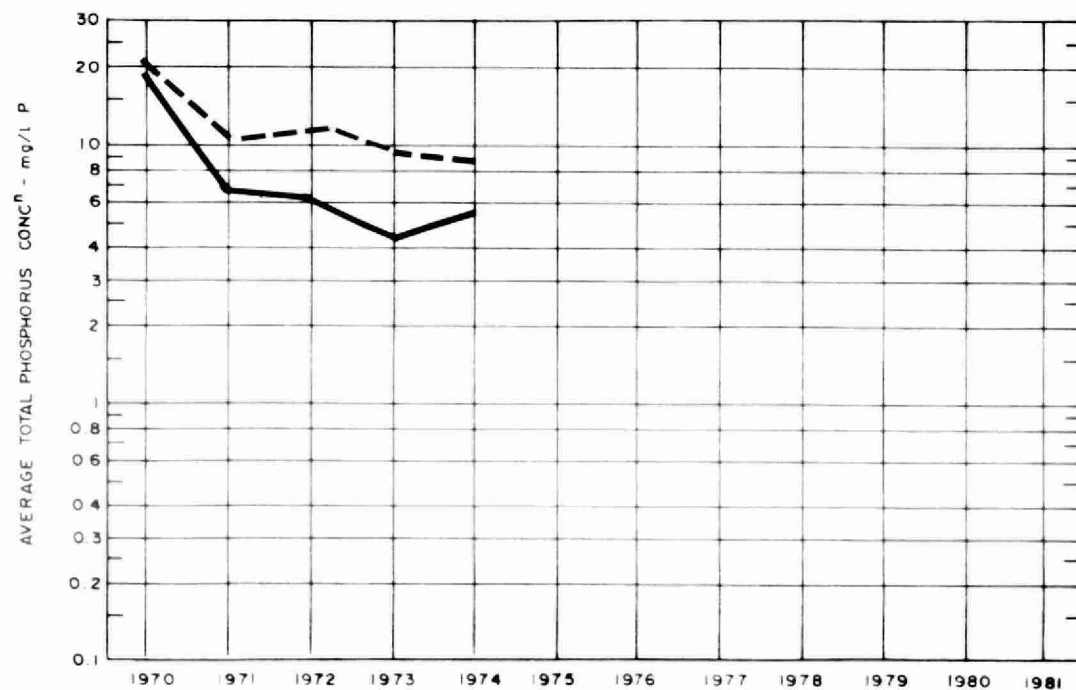
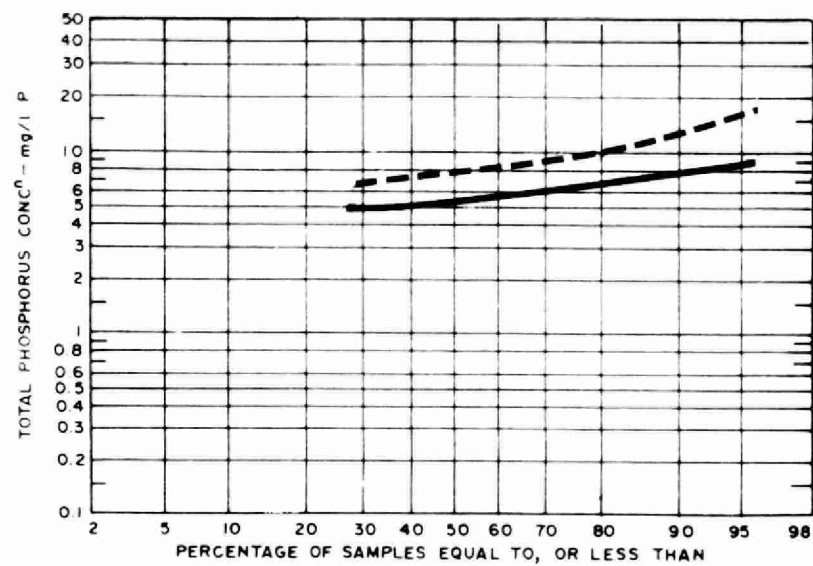
SUSPENDED SOLIDS



PLANT INFLUENT 
 PRIMARY EFFLUENT 
 PLANT EFFLUENT 



PHOSPHORUS

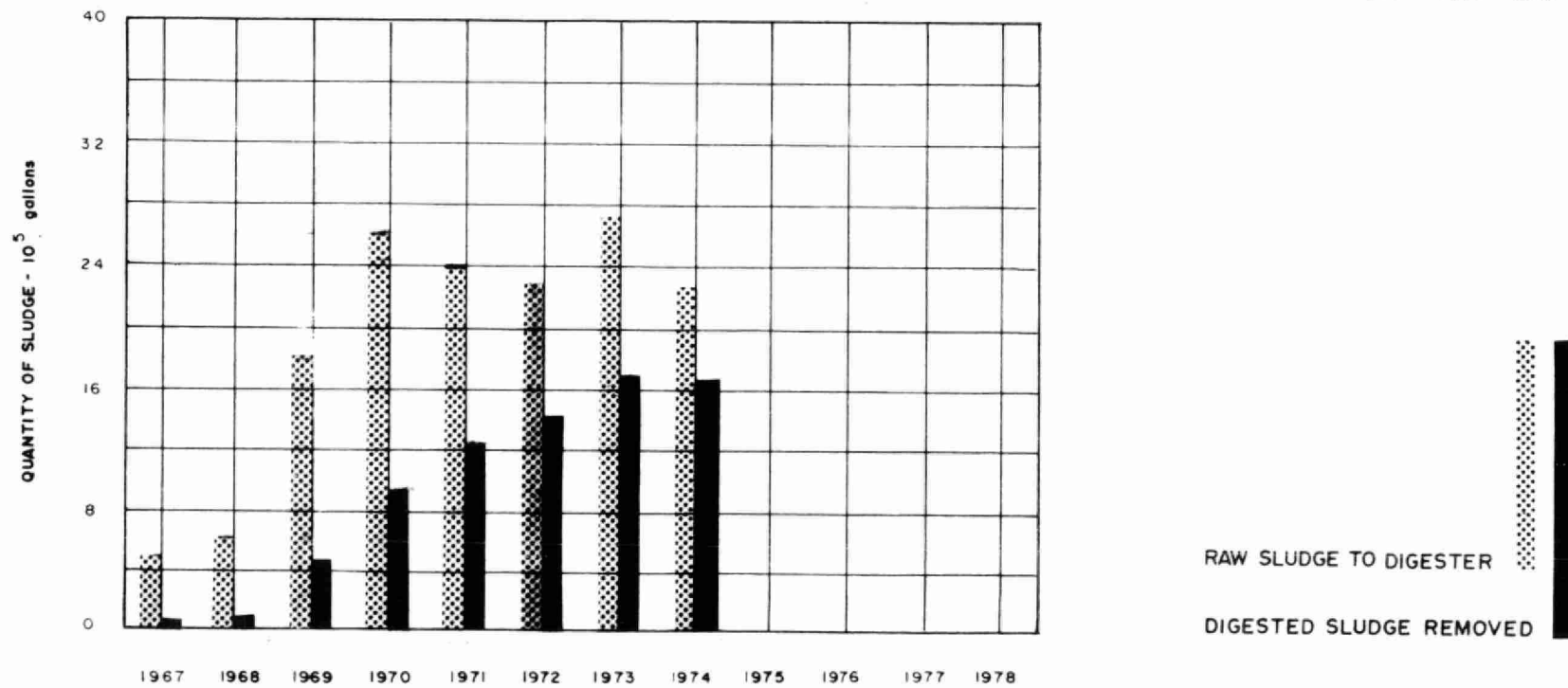
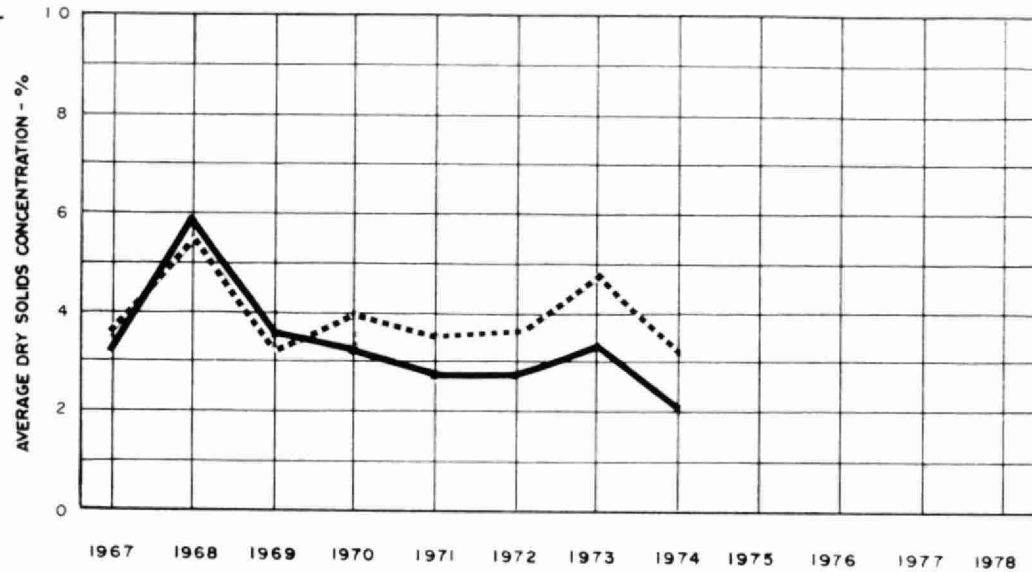


PLANT INFLUENT -----

PLANT EFFLUENT _____

DIGESTION

RAW SLUDGE
DIGESTED SLUDGE —



TREATMENT DATA

MONTH	GRIT	CHLORINATION		PRIMARY EFFLUENT		AERATION			SLUDGE DIGESTION and DISPOSAL							
	QUANTITY REMOVED cubic feet	CL ₂ USED 10 ³ pounds	AVG. DOSE mg/l	BOD mg/l	SUSPENDED SOLIDS mg/l	MLSS CONC mg/l	F/M day ⁻¹	AIR 1000 ft ³ lb BOD	RAW SLUDGE			DIGESTED SLUDGE			SUPER- NATANT T. S. %	AMOUNT HAULED cubic yards
									QUANTITY 10 ⁵ gallons	TOTAL SOLIDS %	VOL. SOLIDS %	QUANTITY 10 ⁵ gallons	TOTAL SOLIDS %	VOL. SOLIDS %		
JAN	125	1.2	3.8	205	135	1800	.33	1.3	1.9	4.0	70	1.2	2.2	55		718
FEB	60	1.1	4.2	145	195	1900	.22	1.9	1.8	3.2	73	1.4	2.3	54		863
MAR	75	1.2	4.1	130	168	1400	.27	2.3	2.0	3.7	73	1.4	2.9	66		814
APR	75	1.2	3.6	67	125	1700	.12	4.0	1.9	3.4	71	1.5	2.4	52		876
MAY	85	1.3	3.9	108	153	2100	.15	2.5	1.9	3.3	75	1.3	2.1	54		756
JUNE	100	1.2	3.8	123	125	1300	.28	2.3	1.8	3.8	76	1.3	2.0	60		742
JULY	90	1.2	4.1	123	163	1700	.21	2.3	1.8	3.4	68	1.3	1.9	58		780
AUG	120	1.4	5.1	145	195	2300	.18	1.7	2.1	2.7	74	1.8	1.8	59		1094
SEPT	90	1.4	5.1	120	185	1600	.22	2.6	2.3	2.7	78	1.5	1.7	61		888
OCT	115	1.3	4.4	130	185	1800	.21	3.1	2.0	3.0	78	1.6	1.6	63		924
NOV	50	1.2	4.1	170	225	1700	.28	1.9	2.1	3.1	73	1.6	1.7	59		948
DEC	105	1.3	4.4	180	223	4500	.11	1.7	1.9	3.3	76	1.4	1.7	54		828
TOTAL	1090	15.0	-	-	-	-	-	-	23.5	-	-	17.2	-	-	-	10231
AVG.	3.1 cu. ft/mil gal	1.3	4.2	137	173	2000	.22	2.3	2.0	3.3	74	1.5	2.0	58		853

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